REMARKS

The Office Action dated August 20, 2008 has been received and carefully studied.

The Examiner has examined claims 1-22 and does not mention the prior restriction requirement, or Applicants' election to proceed with Group I, claims 1-18. Confirmation that the prior restriction requirement has been withdrawn is respectfully requested.

The Examiner states that the Information Disclosure Statement does not contain a concise explanation of the relevance of some of the references. However, concise explanations of relevance were made with respect to DE 2924 239 and DE 3335547 by referencing pages of the specification where these references are discussed. With respect to EP 0 121 771, this document was cited in the International Search Report which is already of record. The Search Report indicates the degree of relevance found by the International Searching Authority. An English language version is attached hereto for the Examiner's convenience. The Examiner's reference to PCT/EP2004/006307 is not understood, as this is the PCT application on which this case is based. The issue, however, is moot, as the Examiner has indicated that all references have been considered.

The Examiner objects to the drawings for various reasons. The Examiner states that it is unclear what reference character "3" is pointing to in Figure 2.

This objection is respectfully traversed.

As stated in the specification, reference character 3 represents more densely spaced vertical ribs, and the ribs can be seen in Figure 2 as small bumps in the sheet. Reference character 3 clearly touches such a rib. Reference character 1 is the microporous film, again as stated in the specification.

The Examiner objects to the disclosure, stating that reference characters 2, 2′ and 3 are used and described inconsistently throughout the specification. The specification indicates that a "rib" is a type of protrusion, and thus the use of the same reference numeral to designate one or the other is not unclear. Nevertheless, by the accompanying amendment, page 16 has been amended to refer to ribs rather than protrusions to address the objection.

The Examiner objects to claims 1-6, 13, 19 and 21 due to inconsistent use of reference characters 2 and 2′, and for various other reasons. By the accompanying amendment, the reference characters have been removed from the claims. Also by the accompanying amendment, the errors noted by the Examiner have been corrected.

The Examiner objects to claims 8-22 under 37 C.F.R. §1.75(c) as being improper multiple dependent claims. By the accompanying amendment, improper multiple dependencies have been eliminated.

The Examiner rejects claims 1-2 under 35 U.S.C. §103(a) as being unpatentable over Abbe et al., U.S. Patent No. 3,159,507 in

view of Zucker, WO 03/026038; claims 3-6 as being unpatentable over Abbe et al. in view of Zucker, and further in view of Kawai et al., U.S. Patent No. 3,210,218, and claim 7 as being unpatentable over Abbe et al. in view of Zucker, and further in view of Farahmandi et al., U.S. Publ. No. 2001/0020319. The Examiner states that Abbe et al. teach a separator material for a battery comprising a first layer in the form of a microporous sheet, which can be made of glass fibers and a synthetic resin of hydrophilic character and can have a number of protrusions/ribs, each defining an area of increased film thickness, on at least one face of a base sheet, and at least one second layer in the form of a planar fleece material bonded to at least some of the protrusions/ribs via welded fused joints. The Examiner admits that Abbe et al. fail to specifically state that the separator material can be used in a lead-acid accumulator/lead-acid battery or that the microporous sheet can be made of a thermoplastic material, but gives the intended use of the separator no patentable weight. The Examiner cites Zucker for its teaching of a separator material for forming a separator for a lead-acid accumulator/battery wherein the separator material comprises a first layer in the form of a microporous sheet which is made of a thermoplastic material. Kawai is cited for its disclosure of protrusions/ribs that run vertically and extend over the entire length of the microporous sheet. Farahmandi et al. is cited for its disclosure of spot welding and ultrasonic welding.

The rejections are respectfully traversed.

Abbe describes, for example with reference to Figure 7, a galvanic cell separator comprising (a) a microporous layer that has on one surface thereof a plurality of ribs, and (b) a fibrous or fleece layer that is fused to the ribs of the microporous layer (see e.g., column 2, line 56 to column 3, line 7). The microporous layer is made of glass fibers which are agglomerated by initial or partial fusion (see column 2, lines 57 to 63), so that the separator is entirely made of glass fibers (see column 1, lines 11 and 12) and does not comprise a layer made of thermoplastic material.

Applicants respectfully submit that one skilled in the art would not be motivated to combine the teachings of Zucker and modify the Abbe separator material as the Examiner sets forth. Zucker discloses a battery separator suitable for a lead-acid accumulator and comprising a microporous polymer layer 3 that is bonded to a fibrous layer 1 by, for example, ultrasonic welding (see abstract and figure). In column 1, lines 60-64 of Abbe it is expressly stated that glass is more suitable than plastic material and that in connection with the disclosure of Abbe, use of glass as the only construction material is important. Indeed, the thrust of the Abbe disclosure is the provision of a layer of glass fibers that are agglomerated by fusion to provide a rigid microporous layer. Consequently, it is one object of Abbe to provide a battery separator made wholly of glass fibers (see

column 2, lines 38-39). Therefore, Abbe teaches away from using a polymer material for making the microporous layer as required by Zucker. Modifying Abbe by changing the glass fiber layer to a thermoplastic material would be completely contrary to the teachings of Abbe, and thus the combination of Abbe and Zucker do not render the present invention obvious.

Claims 3-7 are believed to be allowable by virtue of their dependence, for the reasons articulated above. Neither Kawai et al. nor Farahmandi et al. supply the deficiencies of Abbe and Zucker.

Reconsideration and allowance are respectfully requested in view of the foregoing.

Respectfully submitted,

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(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

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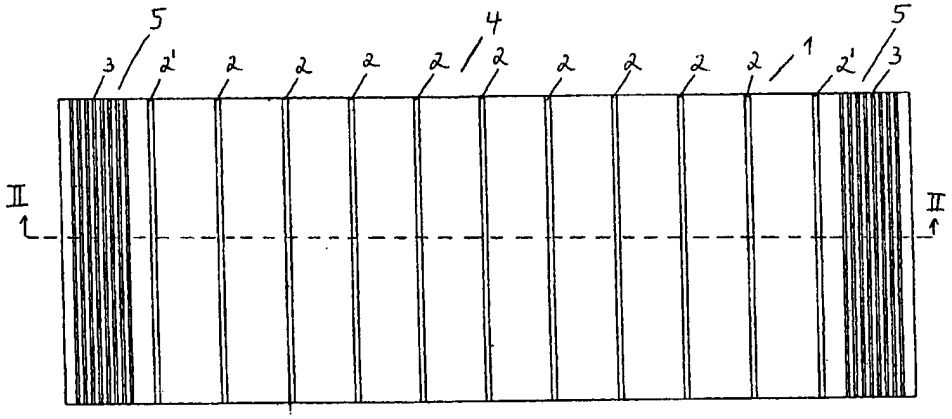
[Fortsetzung auf der nächsten Seite]

(54) Title: SEPARATOR MATERIAL FOR FORMING A SEPARATOR FOR A LEAD-ACID ACCUMULATOR

(54) Bezeichnung: SEPARATORMATERIAL ZUM BILDEN EINES SEPARATORS FÜR EINEN SÄUREAKKUMULATOR



(57) Abstract: Disclosed are a separator material (6) for forming a separator for a lead-acid accumulator, especially in the form of unfinished rolled product, and a method for the production thereof. The inventive separator material (6) comprises a first layer in the form of a microporous film (1) and at least one second layer in the form of a planar fleece material (7). At least one face of the microporous film (1), which is made of a thermoplastic material, is provided with a number of protrusions (2, 2') defining an area with an increased film thickness on a basic film sheet. The fleece material (7) is welded to the film (1) by means of ultrasonic welding in such a way that the planar fleece material (7) is located at least at the level of the surface of the basic film sheet without invading the same in the area of the welded joints (8).

(57) Zusammenfassung: Separatormaterial (6) zum Bilden eines Separators für einen Blei-Säure-Akkumulator, insbesondere in Form nicht konfektionierter Rollenware, sowie ein verfahren zu seiner Herstellung. Das Separatormaterial (6) umfasst eine erste Schicht in Form einer mikroporösen Folie (1) und zumindest eine zweite Schicht in Form eines flächigen Vliesmaterials (7) . Die aus einem thermoplastischen Kunststoff gebildete mikroporöse Folie (1) weist zumindest einseitig auf einem Foliengrundblatt eine Anzahl von Vorsprüngen (2, 2') auf, die jeweils einen Bereich erhöhter Foliendicke definieren. Das Vliesmaterial (7) ist mit der Folie (1) derart verschweisst, dass das f lächige

[Fortsetzung auf der nächsten Seite]

WO 2004/112166 A3

TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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Veröffentlicht:

— *mit internationalem Recherchenbericht*

— *vor Ablauf der für Änderungen der Ansprüche geltenden Frist; Veröffentlichung wird wiederholt, falls Änderungen eintreffen*

(88) **Veröffentlichungsdatum des internationalen Recherchenberichts:** 2. Februar 2006

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

Vliesmaterial (7) im Bereich der Schweissverbindungen (8) mindestens auf der Höhe der Oberfläche des Foliengrundblattes angeordnet ist und nicht in dieses eindringt, wobei zum Verschweissen Ultraschallverschweissen zum Einsatz kommt.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/006307

A. CLASSIFICATION OF SUBJECT MATTER
H01M10/12 H01M2/14 H01M2/18 H01M2/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, INSPEC, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/026038 A (DARAMIC, INC) 27 March 2003 (2003-03-27) page 1, paragraph 1	1,3,8-18
A	page 1, paragraph 1 page 5, paragraph 1 page 6, paragraph 5 - page 7, paragraph 2 page 11, paragraph 4 - page 12, paragraph 1 page 12, paragraph 3 page 16, paragraph 1 claims 1,8,11,12	2,4-7, 19-22

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
8 December 2005	15/12/2005

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Kuhn, T

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/006307

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 470 676 A (NAKANO ET AL) 28 November 1995 (1995-11-28) figures 2,4 column 2, line 33 - line 36 column 4, line 62 - column 5, line 41 column 6, line 24 - line 63 claim 1	1-22
A	EP 0 121 771 A (GRACE GMBH) 17 October 1984 (1984-10-17) page 1, paragraph 1 page 2, paragraph 2 page 3, paragraph 3 page 4, paragraphs 1,2 page 6, line 21 - line 36 claims 1,2,10	1-22

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/EP2004/006307

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